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Transportation of Sealed Radioactive Sources (49 CFR Sections 171-180)

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Interdepartmental letterhead

Office of the General Counsel

Mail Station L- 701

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DATE: July 10, 2014

TO: David Campbell and Emily A. Quinnan

FROM: Diamante Rueda 

Via: Collin Lau 

SUBJECT: Transportation of Sealed Radioactive Sources (49 C.F.R. §171-180)

This is in response to a question from David Campbell and Emily A. Quinnan of the Global Security Directorate, who asked whether the movement of radioactive sources as part of a DHS¹ training exercise is considered to be “in commerce” so as to require compliance with Title 49 Code of Federal Regulations (C.F.R.) § 171-180. After review of the facts and the law, I find that the movement of our radioactive sources is considered to be “in commerce,” and; thus, we must comply with Department of Transportation (DOT) regulations.

BACKGROUND AND FACTS

Lawrence Livermore National Laboratory (LLNL) is a “federally funded research and development center (FFRDC) facility” managed under a contract between the U.S. Department of Energy’s (DOE) National Nuclear Security Administration (NNSA) and the Lawrence Livermore National Security Board of Governors.^{2 3}

LLNL maintains radioactive sources that the Red Team program utilizes.⁴ The radioactive sources comprise of thirteen radioisotopes, including: I 131 (< 14 mCi), Ba 133 (< 20 mCi), Cf 252 (< 1 mCi), Co 60 (< 20 mCi), Co 57 (< 1 mCi), Cs 137 (< 20 mCi), Eu 155 (< 1 mCi), Gd 153 (< 1 mCi), Lu 177m (< 1 mCi), Sn 113 (< 1 mCi), Th 228 (< 0.25 mCi), Zr 95 (< 1 mCi), and Highly Enriched Uranium (HEU) (< 200 uCi). Appendix A shows these radioisotopes in comparison with the DOT “exempt” and “limited” quantities.

¹ The U.S. Department of Homeland Security’s (DHS) Domestic Nuclear Detection Office Red Team (RT) partners with Lawrence Livermore National Laboratory (LLNL) to help train “first responder” throughout the country. Our role in this relationship is to provide radioactive sources during “first responder” training exercises.

² NNSA awarded Contract No. DE-AC52-07NA27344 to Lawrence Livermore National Security, LLC, to manage and operate Lawrence Livermore National Laboratory.

³ Lawrence Livermore National Laboratory (LLNL): Management Sponsors, LLNL.GOV, <https://www.llnl.gov/about/mgtsponsors.html> (Last visited June 20, 2014).

⁴ *Ibid.* *supra* note 1.

LLNL follows the DOE storage, transport, and use of radioactive sources policies. LLNL personnel will ship “limited” quantity and “type A” (yellow 2, white 1 fissile) categories of radioactive sources.⁵ The sources will be shipped with DOT compliant shippers.

As part of the first responders’ training exercise program, LLNL ships radioactive sources via FedEx and/or delivers them to multiple training sites around the nation. Trained LLNL personnel pick up the radioactive sources and place them in various vehicles, such as cars, trucks, airplanes, buses, trains, and boats. On occasion, LLNL personnel may hand-carry the radioactive sources or bury samples in the soil or other locations. The training exercise requires the first responders to search for and find the radioactive sources. After an exercise is completed, trained LLNL personnel will return the samples to the FedEx shipping locations or deliver them back to LLNL.

The transportation of all the radioactive materials already complies with DOE transportation regulations. However, Mr. Campbell and Ms. Quinnan are concerned about whether LLNL has to comply with other DOT regulations because doing so might negatively affect the training value.

For instance, the DOT requires a hazardous materials table, emergency response requirement, hazardous materials communications, training, and security plan.⁶ The hazardous materials communications refers to shipping papers, marking, labeling, and placarding.⁷ The radioactive sources have to be labeled and need to include a bill of lading.⁸ Moreover, a Class A driver has to drive the materials to the appropriate training site.

Mr. Campbell and Ms. Quinnan are concerned that the labeling of radioactive materials, as required by DOT regulations, will interfere with the training purposes because it will over-simplify the exercise.⁹ Lastly, including a bill of lading might be impractical, because it is difficult to know ahead of time where each piece of radioactive material will be transported to at any given time.

⁶ 49 C.F.R. § 171-180

⁷ *Ibid.*

⁸ 49 C.F.R. § 172.1

⁹ Another concern that was raised is that there are a limited number of Class A drivers that are trained to transport these radioactive sources which will make it more burdensome for the LLNL team. We will not address this issue at this time. From our research, a Class A driver’s license can be obtained without much difficulty by attending a 3 day course sponsored by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration – visit: <http://www.phmsa.dot.gov/training>.

QUESTION PRESENTED

When LLNL trained personnel pick up the radioactive sources from FedEx and move them about as part of the DHS training exercise, is it considered “in commerce” so as to trigger compliance with Title 49 C.F.R. § 171-180, the DOT regulations that regulate the movement of controlled materials?

SHORT ANSWER

Yes. LLNL has to comply with Title 49 C.F.R. § 171-180, the DOT regulations that regulate the movement of controlled materials because the transportation of the DOE controlled materials constitutes “in commerce.”

ANALYSIS

LLNL Has to Comply With Hazardous Materials Regulations (HMR) Because LLNL is a Federal Government Contractor; LLNL is Transporting Hazardous Materials as Defined in Title 49 C.F.R. § 179, and the Transportation of the Radioactive Sources Constitutes “Commerce.”

The law as codified in Title 49 U.S.C. § 5101 directs the DOT to establish regulations for the transportation of all hazardous materials, including radioactive materials, in intrastate, interstate, and foreign commerce.¹⁰ The DOT Title 49 C.F.R. outlines the requirements for the transportation of hazardous materials. Title 49 C.F.R. § 171.1 states that “[t]he [DOT] Secretary is authorized to apply these regulations to persons who transport hazardous materials in commerce. In addition, the law authorizes the Secretary to apply these regulations to persons who cause hazardous materials to be transported in commerce.”¹¹

To establish whether the DOT regulations are applicable to LLNL, it is necessary to determine: (A) whether LLNL is a contractor or a governmental entity, (B) whether the radioactive sources are considered “hazardous materials,” and (C) whether picking up the radioactive sources from FedEx and further transporting them would constitute “commerce.”

¹⁰ 49 U.S.C. § 5101

¹¹ 49 C.F.R. § 171.1

A. LLNL is a Federal Government Contractor and is Subject to the DOT Hazardous Materials Regulations.

Title 49 C.F.R. § 171.8 defines a “person” as “an individual, company, association, firm, partnership, society, joint stock company; or a government¹², Indian Tribe, or authority of a government or Tribe, that offers a hazardous material for transportation in commerce, transports hazardous material to support a commercial enterprise, [. . .] maintains, reconditions, repairs, or test a package container . . .”¹³ According to the DOE, the definition of “person” includes DOE contractors.¹⁴ Typically, DOE contractors are those that “package and transport hazardous materials in support of DOE’s missions.”¹⁵

Here, the DOE’s National Nuclear Security Administration (NNSA) has a contract with the LLNS Board of Governors.¹⁶ The DOE determines the mission of LLNL and in exchange, LLNL carries out the necessary research (services) to better meet the DOE’s objectives.¹⁷ Therefore, LLNL is a contractor of the DOE, and is subject to the Federal Hazardous Material Transportation Law.

Also, from the DOT’s point of view, its Federal Motor Carrier Administration defines “contractors” as:

Any person who, under contract with any department, agency, or instrumentality of the executive, legislative, or judicial branch of the Federal Government, transports, or causes to be transported or shipped, a hazardous material or manufactures, fabricated, marks, maintains, reconditions, repairs, or tests a package or container which is represented, marked, certified, or sold by such person as qualified for use in transportation of hazardous materials shall be subject to and comply with all provisions of the Federal Hazardous Material Transportation Law, or the regulations issued thereunder.¹⁸

¹² Generally, government employees are not required to comply with the Hazardous Materials Regulations. According to 49 C.F.R. § 171.1, the transportation of a hazardous materials by a “Federal, state, or local government employee solely for noncommercial Federal, state, or local government purposes” is not subject to the Hazardous Materials Regulations.

¹³ 49 C.F.R. § 171.8

¹⁴ *Radioactive Materials Packaging and Transportation Basic Primer*, OFFICE OF SCIENCE U.S. DEPARTMENT OF ENERGY (June 30, 2014, 11:34 AM), http://www.orau.gov/tdd/bulletins/2009_Transportation_Primer-8-28-2008.pdf.

¹⁵ *Ibid.*

¹⁶ *Ibid. supra* note 2.

¹⁷ *Ibid. supra* note 3.

¹⁸ *How to Comply with Federal Hazardous Materials Regulations*, FEDERAL MOTOR CARRIER ADMINISTRATION/UNITED STATES DEPARTMENT OF TRANSPORTATION (last visited June, 27 2014, 5:06 PM), <http://www.fmcsa.dot.gov/regulations/hazardous-materials/how-comply-federal-hazardous-materials-regulations>.

Based on the above, there is agreement by both the DOE and the DOT that LLNL is a person who is a contractor that would be subject to the Hazardous Materials Regulations.

B. LLNL Radioactive Sources are Considered “Hazardous Materials.”

“Hazardous material” is defined as “a substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and has designated as hazardous under section 5103 of Federal hazardous materials transportation law” (citation omitted).¹⁹

Title 49 U.S.C. § 5103 states that:

The Secretary shall designate material (including an explosive, radioactive material, infectious substance, flammable or combustible liquid, solid, or gas, toxic, oxidizing, or corrosive material, and compressed gas) or group of class of material as hazardous when the Secretary determines that transporting the material in commerce in a particular amount and form may pose an unreasonable risk to health and safety or property.²⁰

In our case, although all the radioactive sources are considered to be “limited” quantities hazardous materials and are excepted from the UN identification number marking requirement described in § 173.422(a), most of the radioactive sources have been classified as “hazardous materials” under Title 49 C.F.R. § 171.²¹ Hence, LLNL must comply with Title 49 C.F.R. § 171-180 as long as the sources are considered to be “in commerce.”

C. Transporting Radioactive Sources Constitutes “Commerce” Because the Definition is Broad and Encompasses All Movement of Property and Meets the Two-Prong Test.

The DOT has established a two-prong test to determine if an activity constitutes commerce.²² The first prong deals with the “commercial nature” of the transportation and the second prong discusses whether the hazardous materials are transported on roads with unrestricted public access.²³

¹⁹ *Ibid. supra* note 13.

²⁰ 49 U.S.C. § 5103

²¹ Note that Cf252, Eu155, Gd153, Lu177m, Th228 were not in the “Hazardous Materials Table.”

²² *PHMSA Interpretation #CHI-91-001*, PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION (last visited June 30, 2014, 1:04 PM),

<http://phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=0b44f71912c6b110VgnVCM1000009ed07898RCRD&vgnnextchannel=56acd3c1af814110VgnVCM1000009ed07898RCRD&vgnnextfmt=print>.

²³ *Ibid.*

i. Commercial Nature

According to Title 49 C.F.R. § 171.8, the term “commerce” is defined as “trade or transportation in the jurisdiction of the United States within a single state; between a place in a state and a place outside of the state; that affects trade or transportation between a place in a state and place outside of the state; or on a United States-registered aircraft.”²⁴ In this context, the term “transportation” is defined as any “movement of property and loading, unloading, or storage incidental to the movement.”²⁵

In our case, shipping the radioactive sources entails a movement of radioactive sources to various sites. More specifically, shipping or transporting radioactive sources requires LLNL to load sources, place the sources in various transportation vehicles such as cars and trucks and to unload them. Thus, our activity could be construed as commercial in nature as described in Title 49 C.F.R. § 171-180.

We could argue that after the sources arrive at the destination via FedEx and after the LLNL personnel pick the radioactive sources and move the sources within the state, the movement of radioactive sources is not commercial in nature because it does not affect the “trade or transportation between a place in a state and a place outside the state.”²⁶ In other words, it is not moved from “point-to-point.” However, this argument is unconvincing because, at the least, LLNL is causing the radioactive sources to be transported under Title 49 C.F.R. §171. That is enough to meet the definition of “in commerce.”

In my research, I have found no case law that specifically defines “commercial nature” of transportation in the context of the Title 49 C.F.R. §171-180. However, the DOT Pipeline and Hazardous Materials Safety Administration (PHMSA) has interpreted HMR such that “any person who transports hazardous material in commerce or causes hazardous material to be transported ‘or movement’ in commerce is subject to the Federal hazardous material transportation law” (citations omitted).²⁷

Therefore, it is my conclusion that LLNL is a Government contractor transporting hazardous materials, and it is likely that any movement of hazardous material will be considered commercial in nature; which satisfies the first prong of the test to determine if an activity constitutes “commerce”.

ii. Roads with Unrestricted Public Access

The second prong requires that transportation occurs on roads with unrestricted public access. According to the DOT’s Research and Special Program Administration,

²⁴ *Ibid. supra* note 13.

²⁵ *Ibid.*

²⁶ *Ibid.*

²⁷ PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION (last visited June 27, 2014, 3:08 PM), <http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.6f23687cf7b00b0f22e4c6962d9c8789/?vgnextoid=144819ad7cd52310VgnVCM1000001ecb7898RCRD&vgnnextchannel=aa8cd3c1af814110VgnVCM100009ed07898RCRD&vgnnextfmt=print>.

the transportation by contractor on roads outside of Government properties is transportation in commerce.²⁸ The PHMSA states, “[i]f a road is used by members of the general public (including dependents of Government employees) without their having to gain access through a controlled access point, transportation on (across or along) that road is in commerce.”²⁹ Additionally, the PHMSA has stated that “if access to a road is controlled at all times through the use of gates and guards, transportation on that road is not in commerce.”³⁰

In our case, the radioactive sources will be transported on public roads and the public will have access to the same roads on which the LLNL personnel will transport the radioactive sources to the training sites. Unless the access to the roads is controlled by the use of gates and guards, the transportation of radioactive sources would occur on public roads; satisfying the second prong of the two prong test; thus, rendering the transportation of radioactive sources as being “in commerce.”

We have examined the Federal Hazardous Material Transportation law to determine if we can be exempted. There are two exemptions available, but they are not applicable.³¹

CONCLUSION

LLNL is a Government contractor transporting hazardous materials “in commerce” because the transportation of radioactive sources is commercial in nature and the radioactive sources will be transported on public roads. Thus, LLNL is subject to the Federal hazardous material transportation law.

RECOMMENDATION

There is a non-legal, practical solution. We have pursued this matter with our Shipping Department, which indicates that it can legally provide several bills of lading and leave the destination address blank. The LLNL personnel could handwrite the destination when the destination becomes apparent for the exercise.³² We recommend that this avenue be pursued, as it appears to be the most reasonable solution.

cc: Kathy Shingleton
Kevin Mahoney
Kathy Bochenski
OGC File

²⁸ *Ibid.*

²⁹ *Ibid. supra* note 22.

³⁰ *Ibid. supra* note 27.

³¹ The regulation in 49 C.F.R. §107.105 provides for a Special Permit exemption which could be a lengthy process and there is no guarantee that such a permit will be granted. The regulation in 49 C.F.R. §107.117 provides for an Emergency Processing Exemption which does not seem to apply as it is meant for emergencies to prevent significant injury to persons or property. See “recommendations” memorandum on file.

APPENDIX A

Exempt and Limited Quantities of Various Radioisotopes.

‘App F’ and ‘App G’ refer to the LLNL ES&H Manual Document 20.2, Appendix F and Appendix G, respectively.

| Radionuclide | Given Amount Less than (mCi) | | App F Exempt Quantities | | | | App G Limited Quantities | | | | |
|-------------------------------|------------------------------------|------|-------------------------|----------|----------|----------|--------------------------|------------------|-------------------|-------------------|-----------|
| | | | Ci/g | Ci | mCi | | A1 Value (Ci) | A2 Value (Ci) | A1 Value (mCi) | A2 Value (mCi) | |
| Ba-133 | 20 | mCi | 2.7E-9 | 2.70E-05 | 2.70E-02 | >Exempt | 81 | 81 | 81,000 | 81,000 | |
| Cf-252 | 1 | mCi | 2.7E-10 | 2.70E-07 | 2.70E-04 | >Exempt | 1.4 | 0.081 | 1,400 | 81 | |
| Co-57 | 1 | mCi | 2.7E-9 | 2.70E-05 | 2.70E-02 | >Exempt | 270 | 270 | 270,000 | 270,000 | |
| Co-60 | 20 | mCi | 2.7E-10 | 2.70E-06 | 2.70E-03 | >Exempt | 11 | 11 | 11,000 | 11,000 | |
| Cs-137 | 20 | mCi | 2.7E-10 | 2.70E-07 | 2.70E-04 | >Exempt | 54 | 16 | 54,000 | 16,000 | |
| Eu-155 | 1 | mCi | 2.7E-9 | 2.70E-04 | 2.70E-01 | >Exempt | 540 | 81 | 540,000 | 81,000 | |
| Gd-153 | 1 | mCi | 2.7E-9 | 2.70E-04 | 2.70E-01 | >Exempt | 270 | 240 | 270,000 | 240,000 | |
| App F: U-235 | HEU | 0.2 | mCi | 2.7E-10 | 2.70E-07 | 2.70E-04 | >Exempt | Unlimited | Unlimited | Unlimited | Unlimited |
| I-131 | 14 | mCi | 2.7E-9 | 2.70E-05 | 2.70E-02 | >Exempt | 81 | 19 | 81,000 | 19,000 | |
| App F: Lu-177 | Lu-177m | 1 | mCi | 2.7E-8 | 2.70E-04 | 2.70E-01 | >Exempt | 810 | 19 | 810,000 | 19,000 |
| | Sn-113 | 1 | mCi | 2.7E-8 | 2.70E-04 | 2.70E-01 | >Exempt | 110 | 54 | 110,000 | 54,000 |
| | Th-228 | 0.25 | mCi | 2.7E-11 | 2.70E-07 | 2.70E-04 | >Exempt | 14 | 0.027 | 14,000 | 27 |
| | Zr-95 | 1 | mCi | 2.7E-10 | 2.70E-05 | 2.70E-02 | >Exempt | 54 | 22 | 54,000 | 22,000 |
| Original data App F: U-235 | HEU | 200 | µCi | 2.7E-10 | 2.70E-07 | 2.70E-04 | | | | | |